

REMARKS

This request for reconsideration is being filed in response to the final Office Action dated January 12, 2007. For the following reasons this application should be allowed and the case passed to issue.

Claims 1-10 are pending in this application. Claims 1-7 and 10 are allowed. Claims 8 and 9 were rejected.

Allowable Subject Matter

Applicants greatly appreciate the indication that claims 1-7 and 10 are allowed.

Claim Rejections Under 35 U.S.C. § 103

Claims 8 and 9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tamura et al. (US 2003/0015995) in view of Barrella (U.S. Pat. No. 4,871,956). This rejection is traversed, and reconsideration and withdrawal respectfully requested. The following is a comparison between the invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 8, is a battery pack malfunction detection apparatus that detects a malfunction in a battery pack constituted with a plurality of chargeable/dischargeable cells comprising a plurality of malfunction detection means. Each malfunction detection means is provided in correspondence to a predetermined number of cells and detects an overcharge malfunction in the corresponding predetermined number of cells during an overcharge detection period and an over-discharge malfunction in the corresponding predetermined number of cells during an over-discharge detection period. A decision-making means makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from the malfunction detection means through a single signal line. Each of the plurality of the malfunction detection

means outputs a first signal if an overcharge malfunction is detected in any of the corresponding predetermined number of cells and outputs a second signal if no overcharge malfunction is detected during the overcharge detection period, outputs the second signal if an over-discharge malfunction is detected in any of the corresponding predetermined number of cells and outputs the first signal if no over-discharge malfunction is detected during the over-discharge detection period, and alternately outputs the output signal during the overcharge detection period and the output signal during the over-discharge detection period to the decision-making means through time sharing. A clock means generates a signal to control a switch means for switching between the first signal and the second signal.

Another aspect of the invention, per claim 9, is a battery pack malfunction detection method for detecting a malfunction in a battery pack constituted with a plurality of chargeable/dischargeable cells comprising generating a first signal upon detecting an overcharge malfunction in any of the cells and a second signal if no overcharge malfunction is detected during an overcharge detection period. A second signal is generated upon detecting an over-discharge malfunction in any of the cells and the first signal if no over-discharge malfunction is detected during an over-discharge detection period. The signal generated during the overcharge detection period and the signal generated during the over-discharge detection period are outputted alternately through time sharing through a single signal line. A switch is controlled to repeatedly select the first signal and the second signal in alternating sequence. A decision is made as to whether or not there is a cell manifesting an overcharge malfunction or an over-discharge malfunction based upon the signal output through time sharing.

The combination of Tamura et al. and Barrella do not suggest the claimed battery pack malfunction detection apparatus and battery pack malfunction detection method because Tamura

et al. and Barrella do not suggest a decision-making means that makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from the malfunction detection means through **a single signal line**, as required by claim 8; and that the signal generated during the overcharge detection period and the signal generated during the over-discharge detection period are outputted alternately through time sharing through **a single signal line**, as required by claim 9.

In the present invention, a decision making means defined in claim 8 makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from the malfunction detection means through a single signal line. Each of the plurality of the malfunction detection means outputs a first signal if an overcharge malfunction is detected in any of the corresponding predetermined number of cells and outputs a second signal if no overcharge malfunction is detected during the overcharge detection period, outputs the second signal if an over-discharge malfunction is detected in any of the corresponding predetermined number of cells and outputs the first signal if no over discharge is detected during the over-discharge detection period, and alternately outputs the output signal during the overcharge detection period and the output signal during the over-discharge detection period to the decision-making means through time sharing.

In Tamura et al., on the other hand, an overcharge detection signal OUi is transmitted via a signal line LUi and an over-discharge signal OLi is transmitted via a signal line LLi (see paragraphs [0041] and [0042]). Thus, the over-charge detection signal and the over-discharge signal are not transmitted via a single signal line through time sharing.

The Examiner asserted that Tamura et al. disclose a single line for the over-charging signal and a single line for the over-discharging signal. However, the present invention, as

required by claims 8 and 9 require that the first and second signals are transmitted via only a single line, not via two separate single lines. Furthermore, Applicants note that claim 1, which is similar to claims 8 and 9, and requires a single signal line, has been allowed.

Barrella does not cure the deficiencies of Tamura et al., as Barrella does not suggest the single signal line, as required by claims 8 and 9.

Obviousness can be established only by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Kotzab*, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Fine*, F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Although a reference can be modified, the prior art must suggest the desirability of modifying a reference. See *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). There is no suggestion or motivation in Tamura et al. or Barrella to modify the apparatus and method of Tamura et al. to provide a decision-making means that makes a decision as to whether or not a cell in an overcharge malfunction state or a cell in an over-discharge malfunction state exists based upon a signal input from the malfunction detection means through a single signal line, as required by claim 8; and that the signal generated during the overcharge detection period and the signal generated during the over-discharge detection period are outputted alternately through time sharing through a single signal line, as required by claim 9.

The only teaching of the claimed battery malfunction detection apparatus and battery malfunction detection method is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must both

be found in the prior art, and not based on Applicants' disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In view of the above remarks, Applicants submit that this application should be allowed and the case passed to issue. If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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